Supplemental Methods

Application of the Emla cream. Supplemental figure S1 demonstrates the application of the Emla cream.

Shape-sorter-drum task SSDT. SSDT belongs to the battery of tasks used in the CIMT. Subjects were required to take 20 objects only with their more affected hand from a standard position marked on the table and put them into a drum. The objects were wooden building bricks which had different shapes (see supplemental figure S2). Objects had to be put into separate slots according to their size and shape. Objects and slots were adapted to the abilities of subjects based on the suggestion of the CIMT examiner. However, for a given subject the task was identically on all measurements and included at least 14 objects. The dependent variable, performance time, was measured from the start of movements to the instant the last object was put into the drum. The test was stopped when the subject was not able to put in all objects with the more-affected hand within 900 seconds.

Grating orienting task GOT. Subjects were seated comfortably at a table, with their hand in a supine position. The index finger was rested on a wooden wedge and fixated by double-faced adhesive tape. Stimuli were applied with a moderate force (producing about 1-2 mm of skin indentation) on the distal pad of the index finger and held for about 1-2 sec. Each dome was tested in a block of 20 trials (10 trials for each of the two orientations which were presented randomly). Based on the findings of Tremblay et al.¹ the 5-mm dome was applied first. If the subject scored under 65% correct answers (less than 13 domes) with the 5-mm dome, the 10-mm dome was selected as the next grating. Ensuing the examiner proceeded to the next grating dome in a sequence of increasing difficulties. To hold the test short and to avoid undue fatigue, the test was stopped when the number of correct answers for the presented dome was less than 13 (i.e., less than 65 % correct answers). We determined GOT thresholds, approximating as the groove width at which responses were 75% correct. Order of testing: 1. the more-affected index finger; 2. the less-affected index finger.
**National Institutes of Health Stroke Scale (NIHSS)**
The NIHSS measures impairment and disability of stroke patients on a 6-point ordinal scale. It assesses volitional arm and hand movements, tone, and mobility. The NIHSS was obtained at the initial examination by a neurologist to describe stroke severity, but not used as a screening tool for inclusion. For further information - see Brott et al.²

**Wolf Motor Function Test (WMFT)**
The WMFT assesses laboratory-based upper-extremity motor function. The test contains 17 items, i.e. 15 timed and 2 strength tasks. The strength-based tasks are measured by weight lifted and grip strength. The timed tasks are rated according to 6-step scales (0 to 5) for functional ability, and the time period patients needed to complete the motor task was measured. Time tasks are ordered from simple to complex, and measure shoulder, elbow, and upper extremity movements. For further information - see Wolf et al.³

**Motor Activity Log (MAL)**
The MAL assesses real-world outcome by a structured interview that obtains information about 20 common activities of daily living carried out outside the laboratory. The modified MAL in German language consists of 30 items. For each activity patients are asked to rate the quality of movement and the amount of use by using a 6-step scale (0 to 5). The items include areas as feeding, dressing, and cleaning. For further information see Uswatte et al.⁴ and Bauder et al.⁵
Supplemental Results

**Correlations between the dependent variables**

Supplemental Table S3 shows the Pearson correlation coefficients between the dependent variables, i.e., the changes in VFHT, the changes in GOT, and the changes in SSDT for the treatment TFD. As Table S3 indicates, we did not found any significant correlations beside a trend for a negative correlation between the changes in SSDT and VFHT (p=.09). Furthermore, the correlations between the raw data of the dependent variables VFHT, SSDT, and GOT for the treatment TFD were also not significant beside a trend for a negative correlation between the raw data of post-testing for SSDT and the raw data of post-testing for VFHT (r=-.49; p=.06) supporting the trend reported above.

**Effects of treatment order**

We tested the assessments for GOT and SSDT at t1 for the patients who received Emla cream on day 1 by performing paired t-tests. T1 on day 1 and t1 on day 2 did not significantly differ in GOT (t=.26; p=.81) and SSDT for this group (n=7). Interestingly, there was a trend for SSDT (t=2.34; p=.06) that possibly suggest long-term effects of TFD on motor performance. However, long-term effects should be demonstrated in separate trials.
Table S3: Pearson Correlation Coefficients and $p$-values between changes in VFHT, changes in GOT, and changes in SSDT for treatment TFD

<table>
<thead>
<tr>
<th>Changes in VFHT</th>
<th>Changes in GOT</th>
<th>Changes in SSDT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$r = -0.20$</td>
<td>$r = -0.46$</td>
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<tr>
<td></td>
<td>$p = 0.48$</td>
<td>$p = 0.09$</td>
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<tr>
<td>Changes in GOT</td>
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<tr>
<td></td>
<td></td>
<td>$p = 0.68$</td>
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</tbody>
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Supplemental Figures

Supplemental Figure S1: Application of the cream to the volar side of the more-affected forearm. VFHT was performed at the point in the middle of the occlusive bandage, i.e. about 1 cm proximal to the wrist.

Supplemental Figure S2: Wooden building bricks showing the different shapes used for SSDT.
Supplemental References


